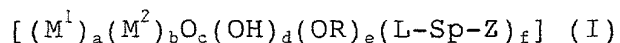


### Patent Claims

1. Dental material containing a cluster according to the general formula



in which

- $M^1, M^2$  independently of each other, stand for a metal atom of the IIIrd or Vth main groups or the 1st to VIIIth sub-groups of the periodic table;
- R is an alkyl group with 1 to 6 carbon atoms;
- L is a co-ordinating group with 2 to 6 complexing centres;
- Sp is a spacer group or is absent;
- Z is a polymerizable group;
- a is a number from 1 to 20;
- b is a number from 0 to 10;
- c is a number from 1 to 30;
- d, e independently of each other, are in each case a number from 0 to 30;
- f is a number from 2 to 30,

any charge of the cluster (I) present being equalized by counterions.

2. Dental material according to claim 2, characterized in that the variables have the following meanings:

- $M^1, M^2$  = independently of each other, Ti and/or Zr;
- R = an alkyl group with 1 to 4 carbon atoms, in particular 1 to 2 carbon atoms;
- L =  $\alpha$ -hydroxycarboxylate ( $-\text{CH}(\text{OH})-\text{COO}^-$ ),

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$\alpha$ -aminocarboxylate ( $-\text{CH}(\text{NH}_2)-\text{COO}^-$ ),  
 $\beta$ -diketonate ( $[-\text{C}(-\text{O}^-)=\text{CH}-\text{C}(=\text{O})\text{R}^{\text{K}}]$ ;  
 with  $\text{R}^{\text{K}}$  = alkyl, preferably  $\text{C}_1$  to  $\text{C}_6$   
 alkyl, particularly preferably  $\text{C}_1$  to  
 $\text{C}_3$  alkyl, in particular methyl,  
 sulfonate ( $-\text{SO}_3^-$ ) or phosphonate  
 ( $-\text{PO}_3^{2-}$ ), particularly preferably  
 carboxylate ( $-\text{COO}^-$ );

Sp = an alkylene group with 1 to 18  
 carbon atoms, an oxyalkylene group with  
 1 to 18 carbon atoms and 0 to 6 oxygen  
 atoms or an arylene group with 6 to 14  
 carbon atoms, the spacer Sp being able  
 to contain one or more, preferably 0 to  
 2 of the groups O, S, CO-O, O-CO, CO-  
 NH, NH-CO, O-CO-NH, NH-CO-O and NH;  
 particularly preferably, Sp is an  
 alkylene group with 1 to 6, in  
 particular 1 to 3 carbon atoms or is  
 absent;

Z = an ethylenically unsaturated group,  
 an epoxide, oxetane, vinyl ether,  
 1,3-dioxolane, spiroorthoester,  
 particularly preferably a methacrylic  
 and/or acrylic group;

a = 2 to 11;

b = 0 to 4.

3. Dental material according to claim 2 or 3,  
 characterized in that L-Sp-Z stands for acrylate,  
 methacrylate, oleate, allyl acetoacetate and/or  
 acetoacetoxyethyl methacrylate.

4. Dental material according to one of claims 2 to  
 4, characterized in that the clusters 1 to 4  
 contain kinds of ligands of the type L-Sp-Z.

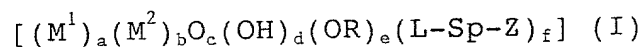
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5. Dental material according to one of claims 2 to 5, characterized in that the cluster has a monodisperse mass distribution.
6. Dental material according to claim 2 or 6, characterized in that the indices c to f assume values such that the positive charges of the metal or metals are completely equalized.
7. Dental material according to one of claims 2 to 7, characterized in that  $M^1$  is equal to  $M^2$ .
8. Dental material according to one of claims 2 to 8, characterized in that it contains one or more further polymerizable components.
9. Dental material according to claim 9, characterized in that the further polymerizable component is a polymerizable polysiloxane, an ionically and/or radically polymerizable organic monomer or a mixture thereof.
10. Dental material according to one of claims 2 to 10, characterized in that it contains an initiator for ionic and/or radical polymerization, filler and/or further additives.
11. Dental material according to one of the previous claims, characterized in that it contains, relative to its overall mass
  - (a) 5 to 90% wt.-% of at least one cluster according to formula (I),
  - (b) 10 to 90 wt.-% of a further polymerizable component,
  - (c) 0.1 to 5.0 wt.-% polymerization initiator, and

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(d) 0 to 90 wt.-% wt.-% filler.

12. Use of a cluster of the general formula



in which

$M^1, M^2$  independently of each other, stand for a metal atom of the IIIrd or Vth main groups or the 1st to VIIIth sub-groups of the periodic table;  
R is an alkyl group with 1 to 6 carbon atoms;  
L is a co-ordinating group with 2 to 6 complexing centres;  
Sp is a spacer group or is absent;  
Z is a polymerizable group;  
a is a number from 1 to 20;  
b is a number from 0 to 10;  
c is a number from 1 to 30;  
d, e independently of each other, are in each case a number from 0 to 30;  
f is a number from 2 to 30,

any charge of the cluster (I) present being equalized by counterions, as dental material or for the preparation of a dental material.

13. Use according to claim 12 as adhesive, coating material, cement or filling material.

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